User's Manual

EPIA-SP

Version 1.11
September 24, 2008

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FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his personal expense.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

CE FC Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord in such a way that people cannot step on it. Do not place anything over the power cord.
8. Always unplug the power cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - The power cord or plug is damaged
    - Liquid has penetrated into the equipment
    - The equipment has been exposed to moisture
    - The equipment has not work well or you cannot get it work according to User's Manual.
    - The equipment has dropped and damaged
    - If the equipment has obvious sign of breakage
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60 C (140F), IT MAY DAMAGE THE EQUIPMENT.

Caution:

Only use the appropriate battery specified for this product.

Do not reuse, recharge, or reheat an old battery.

Do not attempt to force open the battery.

Do not discard used batteries with regular trash.

Discard used batteries according to local regulations.

BOX CONTENTS

- ☒ One VIA Mini-ITX mainboard
- ☒ One Quick Installation Guide
- ☒ One ATA-133/100 IDE ribbon cable
- ☒ One driver and utilities CD
- ☒ One IO bracket

TABLE OF CONTENTS

Box Contents i
Table of Contents ii
Chapter 1 1
Specifications 1
Mainboard Specifications 2
Mainboard Layout 4
Back Panel Layout 5
Back Panel Ports 6
Slots 6
Onboard Connectors 7
Onboard Jumpers 7
Chapter 2 9
Installation 9
CPU 10
Memory Module Installation 14
Connecting the Power Supply 17
Back Panel Ports 19
Connectors 23
Jumpers 38
Slots 41
Chapter 3 43
BIOS Setup 43
Entering Setup 44
Control Keys 45
Navigating the BIOS Menus 46
Getting Help 47
Main Menu 48
Standard CMOS Features 50
IDE Drives 51
Advanced BIOS Features 52
Hard Disk Boot Priority 55
Advanced Chipset Features 56

Integrated Peripherals.....59
Super IO Device 61
Power Management Setup.....63
Peripheral Activities.....65
IRQs Activities 68
PNP/PCI Configurations.....69
IRQ Resources.....71
PC Health Status.....72
Frequency / Voltage Control 73
Load Fail-Safe Defaults 76
Load Optimized Defaults 77
Set Supervisor / User Password 78
Save & Exit Setup 80
Exit Without Saving.....81
Chapter 4 83
Driver Installation 83
Driver Utilities.....84
CD Content 86

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CHAPTER 1

Specifications

The ultra-compact and highly integrated VIA EPIA-SP uses the Mini-ITX mainboard form-factor developed by VIA Technologies, Inc. as part of the company's open industry-wide total connectivity initiative. The mainboard enables the creation of an exciting new generation of small, ergonomic, innovative and affordable embedded systems. Through a high level of integration, the Mini-ITX occupy 66% of the size of FlexATX mainboard form factor. The mainboard comes with an embedded VIA Processor, boasting of ultra-low power consumption, cool and quite operation.

MAINBOARD SPECIFICATIONS

CPU

- VIA C3 / Eden EBGA Processor

Chipset

- VIA CN400 North Bridge
- VIA VT8237R-series South Bridge

Graphics

- Integrated UniChrome™ Pro AGP with MPEG-2 decoding / MPEG-4 Acceleration

Audio

- VIA VT1617A 6-channel AC'97 Codec

Memory

- 1 x DDR 400 / 333 / 266 DIMM socket (up to 1 GB)

Expansion Slot

- 1 x PCI slot

IDE

- 2 x UltraDMA 133/100 connectors, with Direct DOM Support

LAN

- VIA VT6103 10/100 Base-T Ethernet PHY

IEEE 1394

- VIA VT6307S IEEE 1394 Fire Wire

TV-Out (optional)

- VIA VT1623M TV Encoder

Back Panel I/O Ports

- 1 x PS/2 mouse port and 1 x PS/2 keyboard port
- 1 x RJ-45 LAN port
- 1 x Serial port
- 2 x USB 2.0 ports
- 1 x RCA port (SPDIF or TV out)
- 1 x S-Video port
- 1 x VGA port
- 3 x Audio Jacks: line-out, line-in and mic-in (Horizontal, Smart 5.1 Support)

Onboard I/O Connectors

- 3 x USB pin headers for 6 additional USB 2.0 ports
- 1 x IEEE 1394 pin header
- 1 x Serial port pin header for COM2
- 1 x VIP pin header
- 1 x Front Panel audio pin header (Mic-in and Line-out)
- 1 x CD audio-in connector
- 1 x FIR pin header
- 1 x KBMS pin header (KB/MS or CIR)
- 1 x LPT port pin header
- 1 x Wake On LAN connector
- 2 x Fan connectors (CPU Fan and System Fan)
- 1 x +12V power connector
- 1 x SMBus connector
- 1 x LVDS (function to be supported w/ an additional daughter card)
- 1 x WP pin header

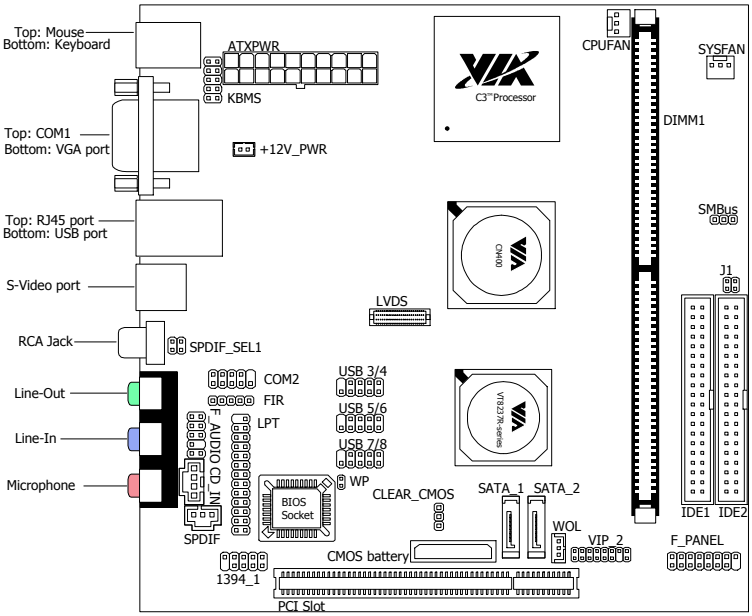
BIOS

- Award BIOS with 4/8Mbit flash memory capacity
- ACPI2.0, SMBIOS2.1 and DMI2.2

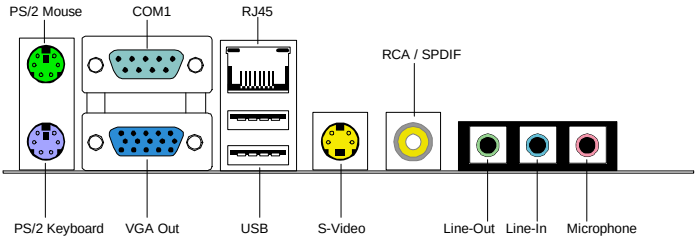
Form Factor

- Mini-ITX (6 layers)
- 17 cm X 17 cm

MAINBOARD LAYOUT



BACK PANEL LAYOUT



BACK PANEL PORTS

Port	Description	Page
Audio Jacks	3 Audio ports (line-out, line-in and mic-in)	19-22
COM1	Serial port 1	19
PS/2 Mouse	PS/2 mouse port	19
PS/2 Keyboard	PS/2 keyboard port	19
RCA/SPDIF	RCA port (SPDIF or TV out)	19-20
RJ45	RJ45 port	19-20
USB	USB 2.0 ports	19-20
VGA	VGA port	19
S-Video	S-Video port	19-20

SLOTS

Port	Description	Page
DDR DIMM	Memory module slot	14-16
PCI	Expansion card slot	41-42

ONBOARD CONNECTORS

Connector	Description	Page
+12V_CONN	12V Power connector	12-13
1394_1	IEEE 1394 connector	31-32
ATXPWR	Power cable connector	17-18
CD_IN	Onboard CD audio cable connector	31-32
COM 2	COM port 2 connector	31-32
CPUFAN	CPU fan connector	12
FIR	Fast Infrared Radiation connector	28
F_AUDIO	Front Audio connector	33-34
F_PANEL	Front panel connector	26-27
IDE 1-2	IDE drive connectors	23-24
KBMS Header	Keyboard and Mouse connector	38, 40
LPT	Parallel port connector	28-29
LVDS	LVDS connector	36-37
SATA1 and 2	Serial ATA 1 and 2 connectors	25
SMBus_Header	SMBus connector	33
SYSFAN	System fan connector	12
USB 3-4/5-6/7-8	Universal Serial Bus 2.0 connectors 3-4/5-6/7-8	30
VIP_2	VIP connector	35
WOL	Wake On LAN connector	31

ONBOARD JUMPERS

Jumper	Description	Page
CLEAR_CMOS	Reset CMOS settings	38-39
J1	IDE selector	38, 40
SPDIF_SEL	S/PDIF selector	38, 40
WP	BIOS write protection setting	38, 40

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CHAPTER 2

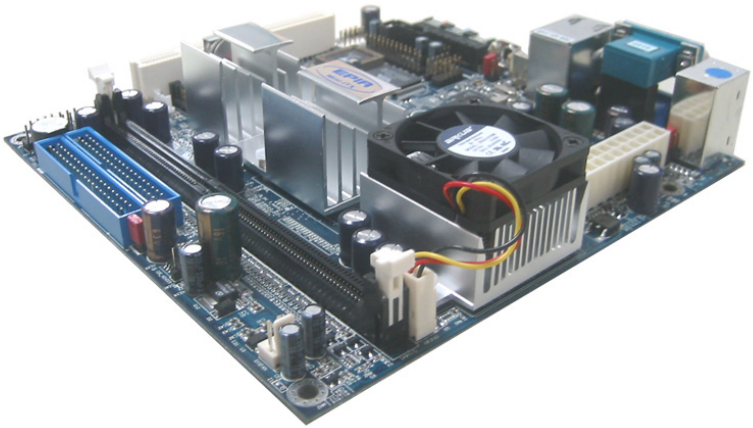
Installation

This chapter provides you with information about hardware installation procedures. It is recommended to use a grounded wrist strap before handling computer components. Electrostatic discharge (ESD) can damage some components.

CPU

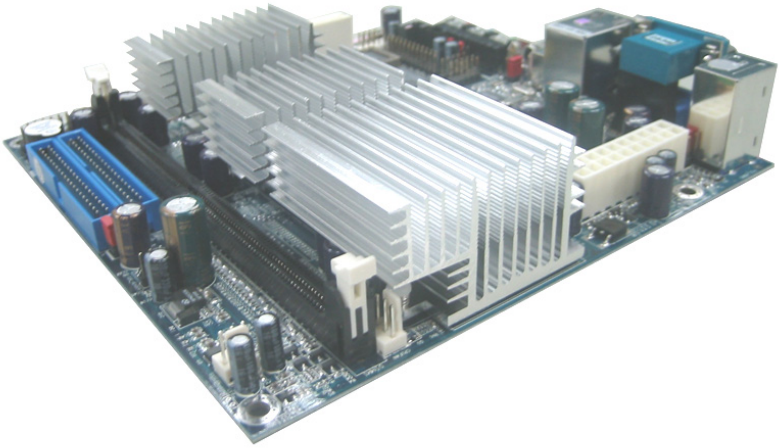
The VIA C3 E-Series Processor

The VIA EPIA-SP Mini-ITX mainboard includes an embedded VIA C3 or Eden Processor. The VIA C3 Processor provides ultra-low power consumption and advanced thermal dissipation properties. The VIA C3 Processor requires heatsink and a CPU fan to provide sufficient cooling. Ensure that the CPU fan is correctly installed as shown.



The VIA Eden Processor

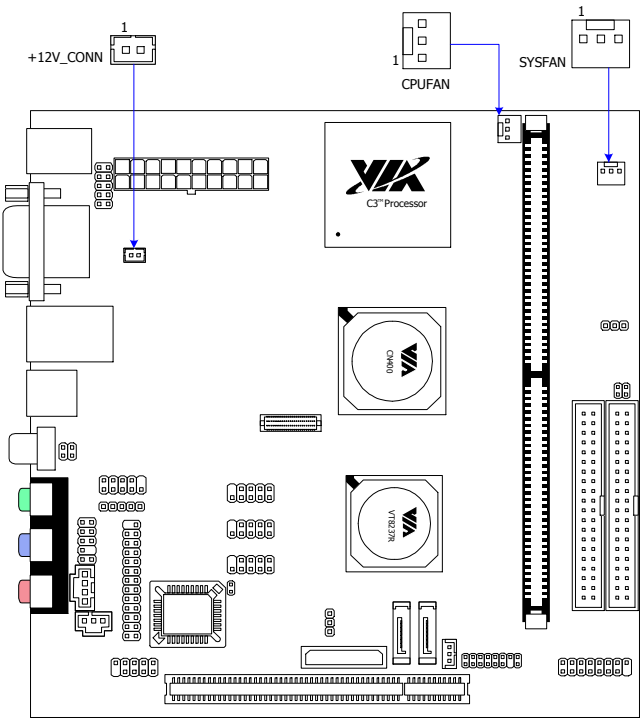
Providing ultra-low power consumption and advanced thermal dissipation properties, the VIA Eden Processor features a fanless design. The VIA Eden Processor requires only a heatsink as shown.



Caution:
This mainboard is not designed to support overclocking. Any attempt to operate beyond product specifications is not recommended. *We do not guarantee the damage or risks caused by inadequate operation or beyond product specifications*.

CPU Fan and System Fan: CPUFAN and SYSFAN

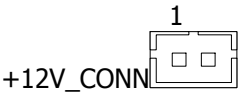
The CPUFAN (CPU fan) and SYSFAN (system fan) run on +12V and maintain system cooling. When connecting the wire to the connectors, always be aware that the red wire is the Positive and should be connected to the +12V. The black wire is Ground and should always be connected to GND. The CPU system and power fan connectors have sensors to support fan monitoring except for +12V_CONN.



+12V Power Connector

This 12V power connector is used to provide additional +12V power to the rest of the system.

Pin	Signal
1	+12V
2	GND

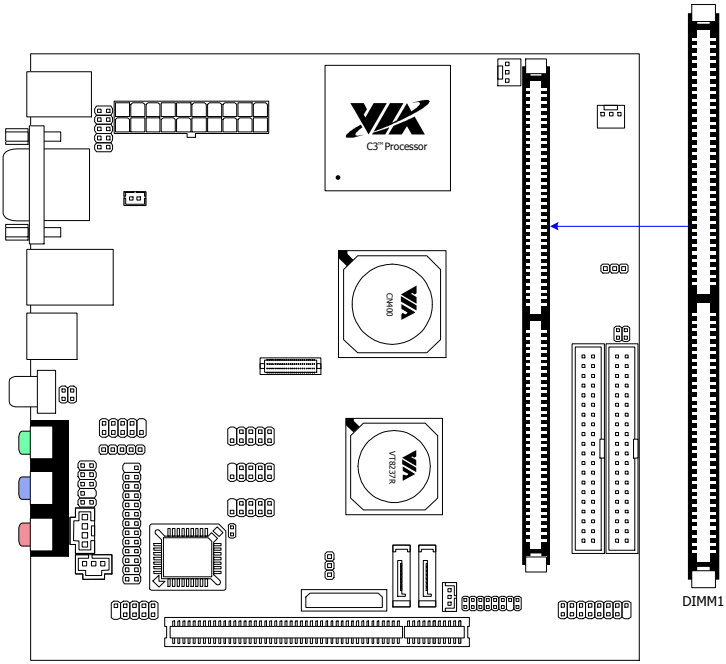


MEMORY MODULE INSTALLATION

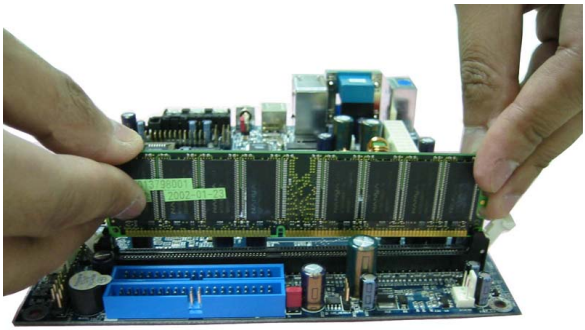
The VIA EPIA-SP Mini-ITX mainboard provides one 184-pin DIMM slot for DDR400/333/266 SDRAM memory modules and supports the memory size up to 1GB.

DDR SDRAM Module Installation Procedures

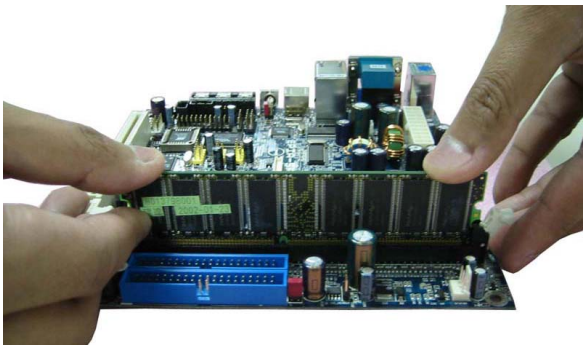
- Locate the DIMM sockets in the motherboard.



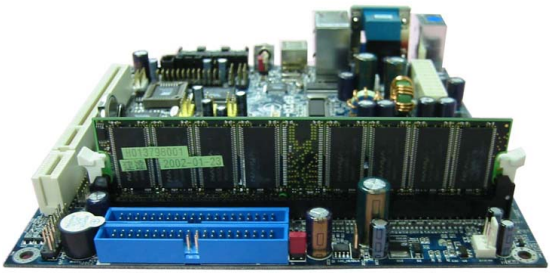
- Unlock a DIMM socket by pressing the retaining clips outward.



- Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



- Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



Available DDR SDRAM Configurations

Refer to the table below for available DDR SDRAM configurations on the mainboard.

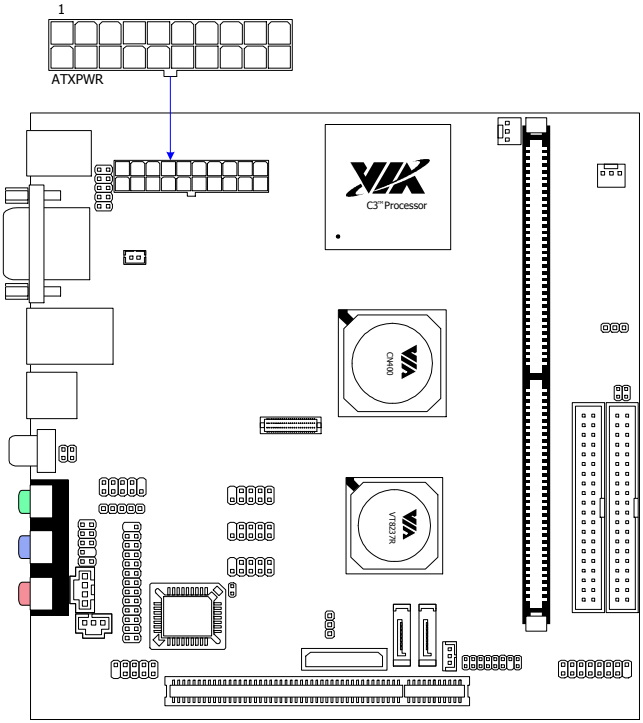
Slot	Module Size	Total
DIMM	64MB, 128MB, 256MB, 512MB, 1GB	64MB-1GB
Maximum supported system memory		64MB-1GB

CONNECTING THE POWER SUPPLY

The VIA EPIA-SP Mini-ITX mainboard supports a conventional ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed correctly to ensure that no damage will be caused.

ATX 20-Pin Power Connector

To connect the ATX power supply, make sure the power plug is inserted in the proper orientation and the pins are aligned. Then push down the plug firmly into the connector.

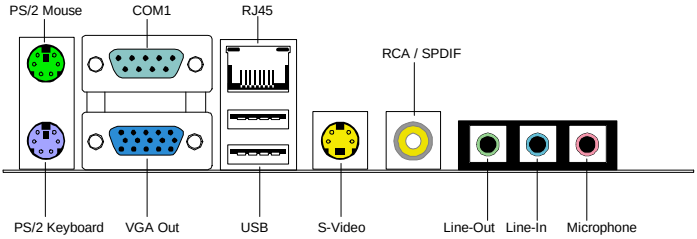


ATX 20 Pin Power Connector

Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	Power Supply On
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power Good	18	NC
9	+5V Standby	19	+5V
10	+12V	20	+5V

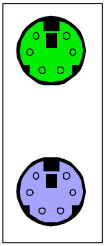
BACK PANEL PORTS

The back panel has the following ports:



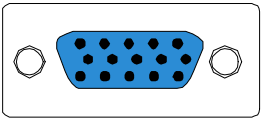
Keyboard and Mouse

The green 6-pin connector is for a PS/2 mouse. The purple connector is for a PS/2 keyboard.



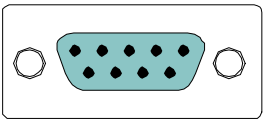
VGA Out

The 15-pin female VGA connector can be used to connect to any analog VGA monitor.



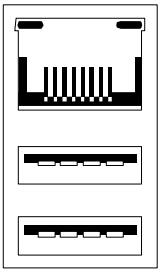
Serial port: COM 1

This 9-pin COM 1 port is for pointing devices or other serial devices.



RJ45 10/100 LAN Connector

The mainboard provides a standard RJ-45 port. This port allows connection to a Local Area Network (LAN) through a network hub



USB 2.0 ports 1and 2

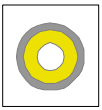
These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

S-Video port

This port allows you to connect TV monitor or S-video device to the mainboard.

SPDIF jack

This jack connects to external audio output devices.



Audio Port:

Line Out jack

This Line Out (lime) jack connects a headphone or a speaker. In 6-channel mode, the function of this jack becomes Front Speaker Out.

Line In jack

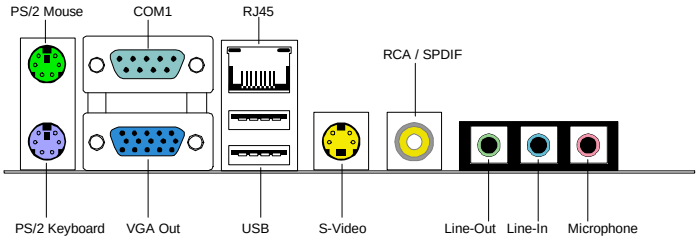
This Line In (light blue) jack connects a tape player or other audio devices. In 6-channel mode, the function of this jack becomes Rear Speaker Out.

Microphone jack

This Mic (pink) jack connects a microphone. In 6-channel mode, the function of this jack becomes Bass / Center Speaker Out.

Note:
The audio ports can be switched to Smart 5.1 6-channel audio output. You can enable the function by clicking the "Vinyl Audio" icon on your desktop after installing the audio driver.

After completing the previous installation, connect the speakers to the 3-jack connectors on the back panel as shown.



Shown below are the corresponding connections to setup the 6-channel system.

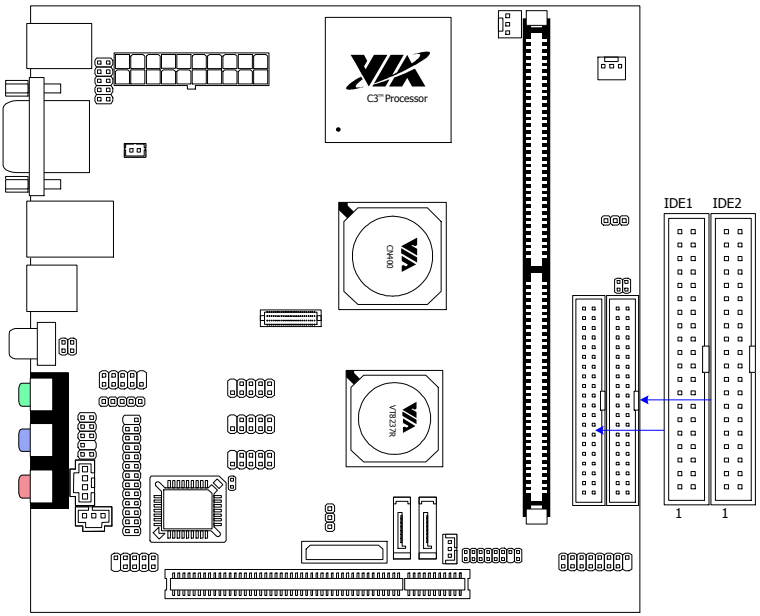
Jack	2-channel	6-channel
Line-out	Line-out	Front (Left/Right)
Line-in	Line-in	Rear (Left/Right)
Microphone	Microphone	Center/Sub-woofer

CONNECTORS

Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced IDE and Ultra DMA 133/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 133/100 functions. You can connect up to four hard disk drives, CD-ROM and other devices.

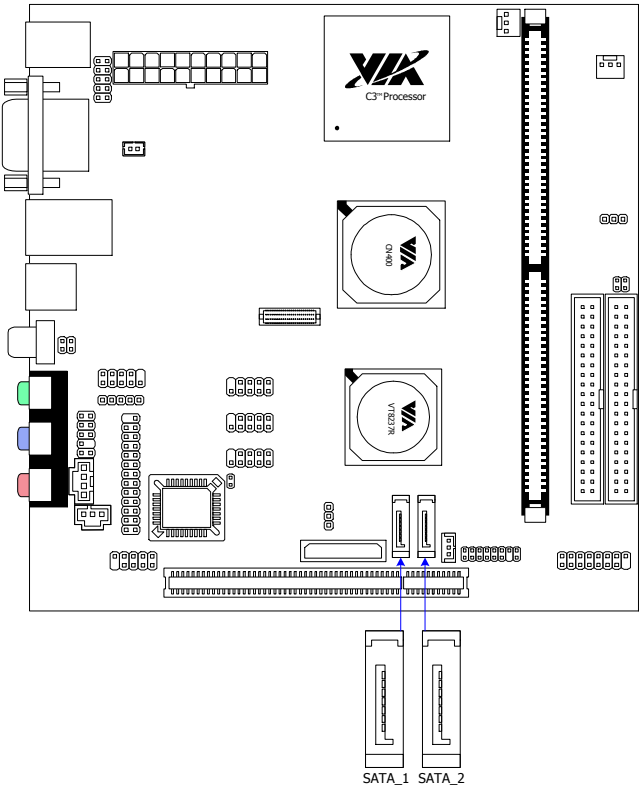
The primary hard drive should always be connected to IDE1 as the master drive. Both IDE drives can connect to a master and a slave drive.



If two drives are connected to a single cable, the jumper on the second drive must be set to slave mode. Refer to the drive documentation supplied by the vendor for the jumper settings. Both IDE1 and IDE2 have a 20th pin included. The 20th pin was added to provide extra voltage to power 40-pin Disk-on Modules (DOM). See voltage selector: J1 on page 38 and 40. You must use IDE cables that do not block the 20th pin.

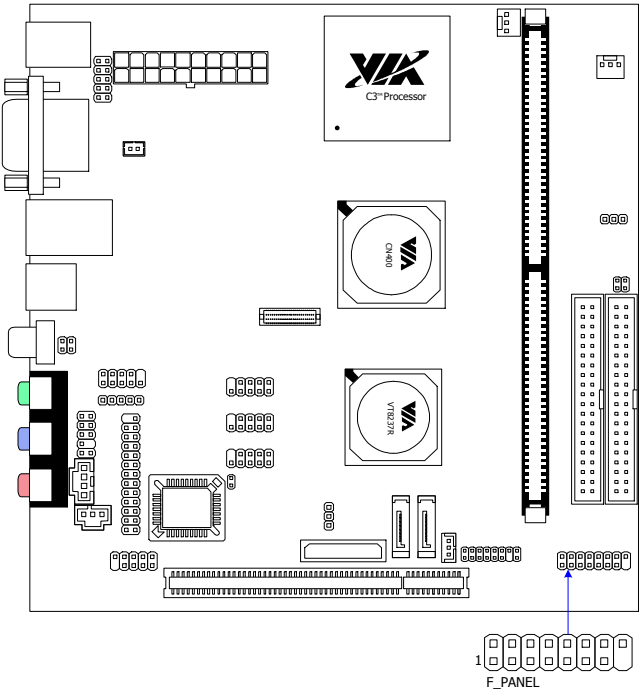
Serial ATA Connectors: SATA1 and SATA2

These next generation connectors support the thin Serial ATA cables for primary internal storage devices. The current Serial ATA interface allows up to 150MB/s data transfer rate, faster than the standard parallel ATA with 133 MB/s (Ultra DMA).



Case Connector: F_PANEL

The F_PANEL pin header allows you to connect the power switch, reset switch, power LED, HDD LED and the case speaker.



Case Connector: F_PANEL

Pin	Signal	Pin	Signal
1	+5VDUAL	2	+5V
3	+5VDUAL	4	HD_LED
5	-PLED	6	PW_BN
7	+5V	8	GND
9	NC	10	RST_SW
11	NC	12	GND
13	SPEAK	14	+5V
15	Key	16	-SLEEP_LED

Power Switch (PW_BN)

Connect to a 2-pin power button switch. Pressing this button will turn the system power on or off.

Reset Switch (RST_SW)

The reset switch is used to reboot the system rather than turning the power ON/OFF. Avoid rebooting the system, if the HDD is still working. Connect the reset switch from the system case to this pin.

Power LED (-PLED)

The LED will light when the system is on. If the system is in S1 (POS - Power On Suspend) or S3 (STR - Suspend To RAM) state, the LED will blink.

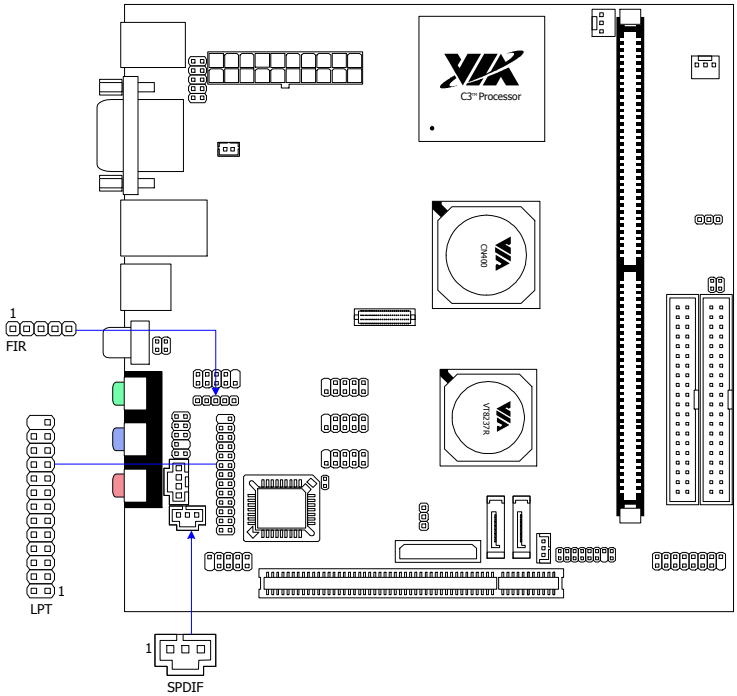
HDD LED (HD_LED)

HDD LED shows the activity of a hard disk drive. Avoid turning the power off when the HDD LED still has a lit. Connect the HDD LED from the system case to this pin.

Fast IrDA Infrared Module Connector: FIR

This pin header is used to connect to an IrDA module. The BIOS settings must be configured to activate the IR function.

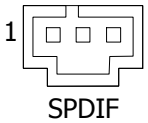
Pin	Signal	Description
1	+5V	VCC
2	IRRX1	FIR/SIR Data Receive
3	IRRX	SIR Data Receive
4	GND	Ground
5	IRTX	FIR/SIR Data Transmit



Digital Audio Connector: S/PDIF

This connector is for connecting the Sony Philips Digital Interface (S/PDIF) bracket. The S/PDIF output provides digital audio to external speakers or compressed AC3 data to an external Dolby Digital Decoder. The feature is available only with stereo system that has digital output function.

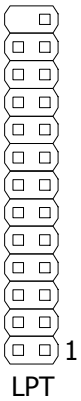
Pin	Signal
1	+5V
2	S/PDIF
3	GND



Parallel Port Connector: LPT

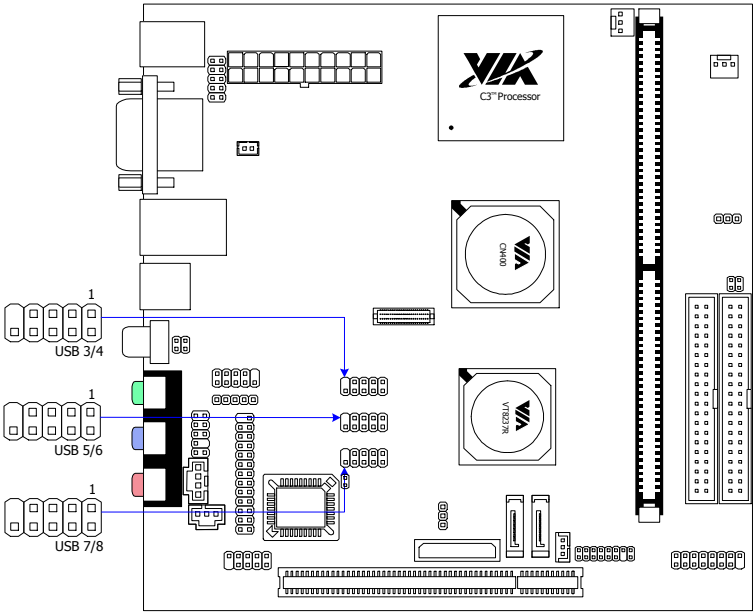
The mainboard provides a 25-pin header to be able to connect a 25-pin female external connector for LPT (parallel port). A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) modes.

Pin	Signal	Pin	Signal
1	STROBE	14	AUTO FEED#
2	DATA0	15	ERR#
3	DATA1	16	INIT#
4	DATA2	17	SLIN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACK#	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT		



USB Pin Connectors: USB 3-4, 5-6, and 7-8

The mainboard provides 3 front USB pin header connectors, allowing up to 6 additional USB2.0 ports up to maximum throughput of 480 Mbps. Connect each 2-port USB cable into each pin headers. These ports can be used to connect high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modem and the like.

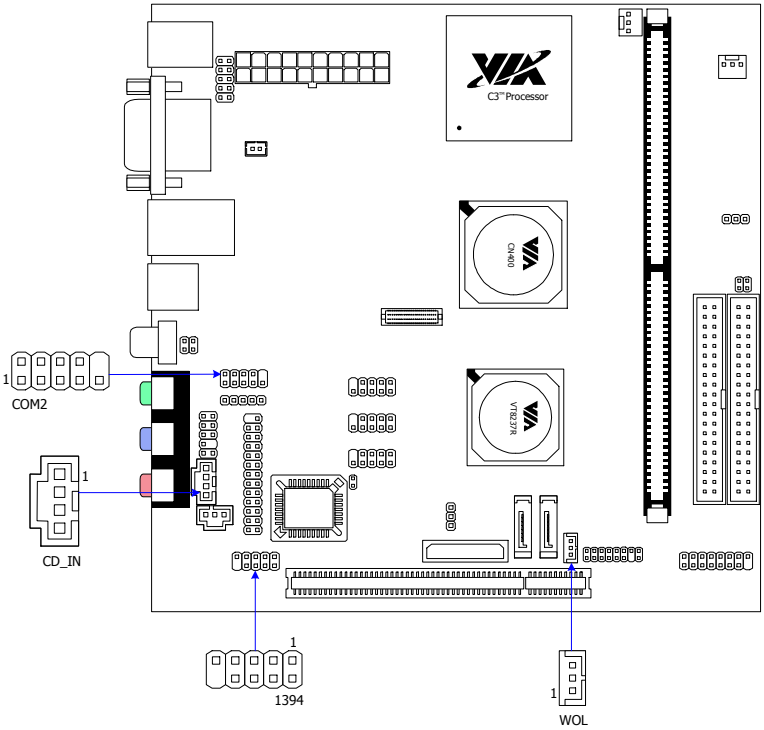


USB connectors: USB 3-4, 5-6, and 7-8

Pin	Signal	Pin	Signal
1	USBVCC	2	USBVCC
3	USBD_T2-	4	USBD_T3-
5	USBD_T2+	6	USBD_T3+
7	GND	8	GND
9	Key	10	GND

Wake-On LAN: WOL

This connector allows you to connect a network card with the Wake-On LAN function. The connector will power up the system when a signal is received through the network card. Please note that the function of ACPI WOL may be disabled when users will unplug the power cord or turn off the power button manually.



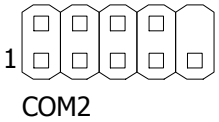
Wake-On LAN connector: WOL

Pin	Signal	Description
1	+5VDUAL	VCC
2	GND	Ground
3	WOL IN	Wake on LAN Input

Serial Port: COM 2

COM2 can be used to attach additional port for serial mouse or another serial device.

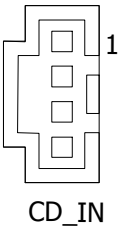
Pin	Signal	Pin	Signal
1	DCD	2	SIN
3	SOUT	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	Key



CD Audio Connector: CD_IN

This connector allows you to receive stereo audio input from sound source such as a CD-ROM.

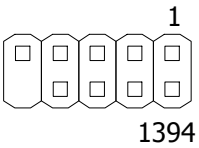
Pin	Signal
1	Left channel
2	GND
3	GND
4	Right channel



FireWire: IEEE1394

FireWire is a serial I/O interface that provides you fast data transfer rates. The mainboard has one FireWire pin header to provide PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs and portable devices.

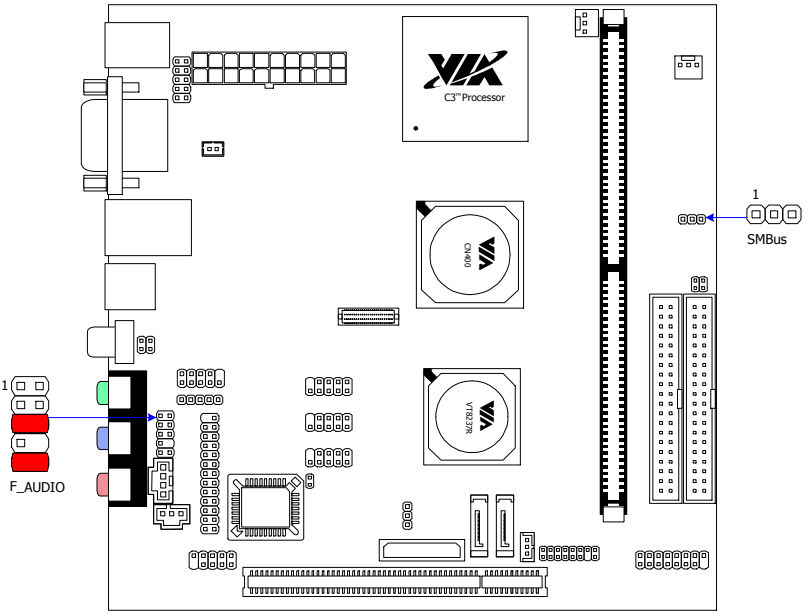
Pin	Signal	Pin	Signal
1	TPA0+	2	TPA0-
3	GND	4	GND
5	TB0+	6	TPB0-
7	1394_VDD	8	1394_VDD
9	GND	10	Key



System Management Bus Connector: SMBus

The pin header allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.

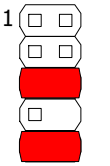
Pin	Signal
1	SMBCK
2	SMBDT
3	GND



Front Panel Audio Connector: F_AUDIO

This is an interface for the VIA front panel audio cable that allow convenient connection and control of audio devices. By default, the pins labeled LINE_OUT_R/NEXT_R and the pins LINE_OUT_L/NEXT_L are shorted with jumper caps. Remove the caps only when you are connecting the front panel audio cable.

Pin	Signal	Description
1	FRNMIC	Front panel microphone input
2	AGND	Ground used by analog audio circuit
3	MIC_BIAS	Microphone power
4	+5V AUDIO	VCC used by analog audio circuit
5	LINE_OUT_R	Right channel audio signal
6	NEXT_R	Right channel audio signal return
7	NC	No connection
8	Key	No pin
9	LINE_OUT_L	Left channel audio signal
10	NEXT_L	Left channel audio signal return



F_AUDIO

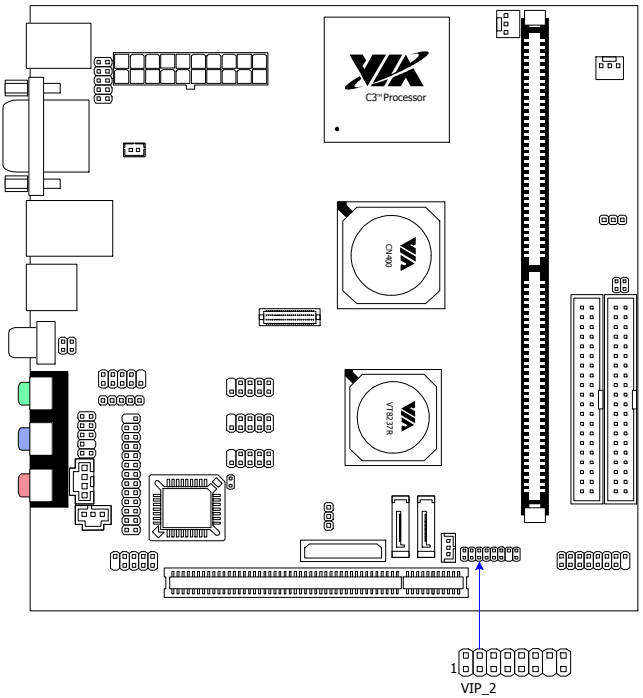
Note:

If you don't want to connect to the front audio header, pins 5 & 6, 9 & 10 have to be jumpered in order to have signal output directed to the rear audio ports. Otherwise, the Line-Out connector on the back panel will not function.

Video Interface Port Pin Connector: VIP_2

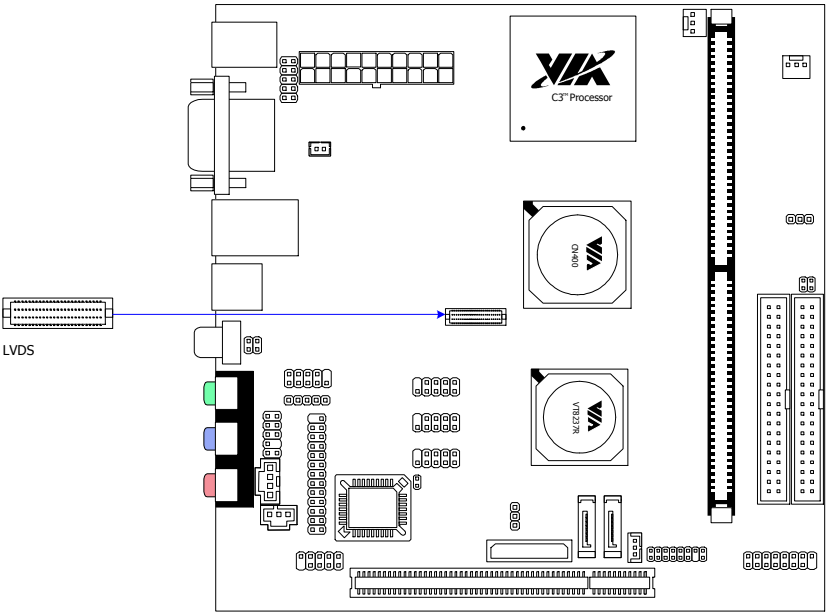
This pin header allows you to use the capture function inside the North Bridge.

Pin	Signal	Pin	Signal
1	GND	2	CAPD0
3	CAPD7	4	CAPD4
5	CAPD6	6	CAPD5
7	GFPHS	8	CAPD2
9	CAPD1	10	CAPD3
11	GFPVS	12	CAPCLK
13	SMBDT	14	KEY
15	SMBCK	16	GND



LVDS Connector:

This connector works as the interface to multi display devices. An additional daughter card is required for a certain display support. Daughter cards for LVDS and DVI are currently available respectively.



LVDS Connector

Pin	Signal	Pin	Signal
1	GND	2	+5V
3	GFPCLK	4	+5V
5	GND	6	GND
7	GFPD12	8	GFPD15
9	GFPD11	10	GFPD14
11	GFPD1	12	GFPD3
13	GND	14	GND
15	GFPD6	16	GFPD16
17	GFPD7	18	GFPD17
19	GFPD0	20	GFPD2
21	GND	22	GND
23	GFPD4	24	GFPD18
25	GFPD8	26	GFPD19
27	GND	28	GND
29	GFPD5	30	GFPD21
31	GFPD9	32	GFPD20
33	GND	34	GND
35	GFPD10	36	GFPD22
37	GFPD13	38	GFPD23
39	GND	40	GND
41	ENPVDD	42	GFPVS
43	ENPVEE	44	GFPHS
45	FPBKLP	46	GFPDE
47	PWRGD_SB	48	TVBSCK_R
49	+3.3V	50	TVBSDA_R

Note:

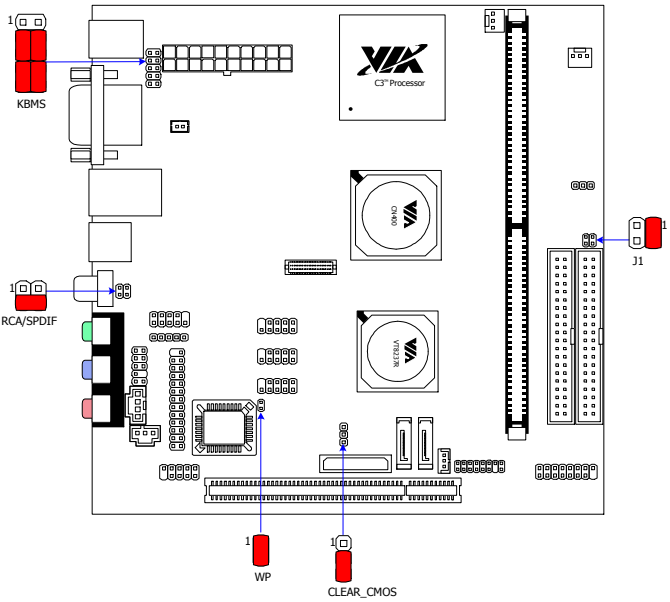
ENPVDD: Enable Panel VDD power

ENVEE: Enable panel VEE power

GFPD: Graphic Flat Panel Device signals.

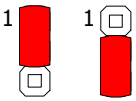
JUMPERS

The mainboard provides jumpers for setting some mainboard functions. This section will explain how to change the settings of the mainboard functions using the jumpers.



Clear CMOS: CLEAR_CMOS

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS that include system setup information such as system passwords.



1-2: Normal (Default)
2-3: Clear CMOS

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Replace the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

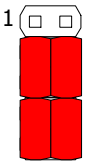
Caution:
Except when clearing the RTC RAM, never remove the cap on CLEAR_CMOS jumper default position. Removing the cap will cause system boot failure. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

PS2 Header: KBMS (Keyboard Mouse)

When the pin header is not in use, please short pin 3&5, pin 4&6, pin 7&9 and pin 8&10.

Pin	Signal
1	+5V
3	KB_CLK
5	EXT_KBCLK
7	MS_CLK
9	EXT_MSCLK

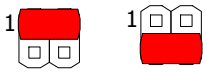
Pin	Signal
2	GND
4	KB_DATA
6	EXT_KBDATA
8	MS_DATA
10	EXT_MSDATA



KBMS

RCA Video or S/PDIF Select: RCA / SPDIF

Using this selector, users can select either RCA Video or S/PDIF as the enabled function on the dual-purpose port. For TV-out composite function, please short 1-2. For S/PDIF function, short 3-4 (default).

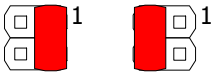


1-2: RCA Video
3-4: S/PDIF (Default)

Voltage Selector: J1

The 20th pin on both IDE connectors can provide either 3.3V or 5V to the IDE device.

Pin	Signal
1	DOM_Power
2	+5V
3	DOM_Power
4	+3.3V



1-2: +5V (Default)
3-4: +3.3V

BIOS Write Protection: WP

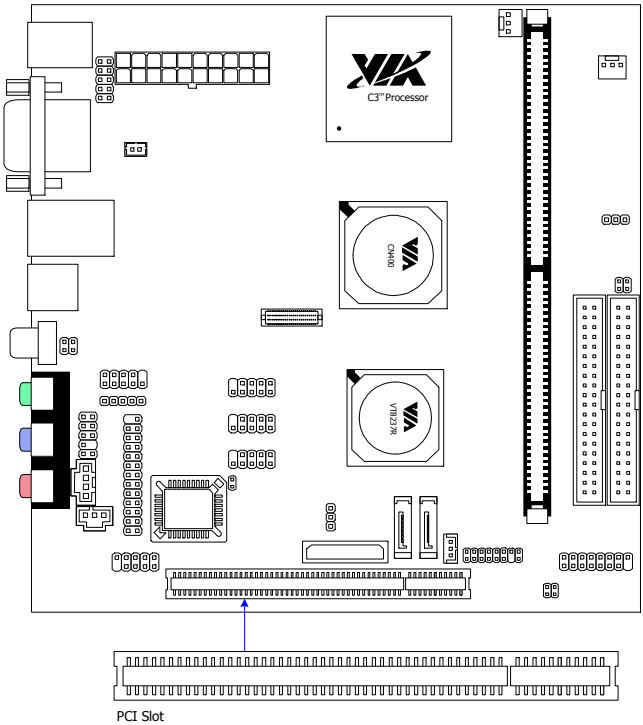
This jumper allows you to protect from flashing the BIOS. BIOS Write Protection setting: pin1 = /WP & /TBL, pin2 = GND, short 1-2 (default)

WP

SLOTS

Peripheral Component Interconnect: PCI

The PCI slot allows you to insert PCI expansion card. When adding or removing expansion card, unplug first the power supply. Read the documentation for the expansion card if any changes to the system are necessary.



PCI Interrupt Request Routing

The IRQ (interrupt request line) are hardware lines over which devices can send interrupt signals to the microprocessor. The "PCI & LAN" IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT B#	INT C#	INT D#	INT A#
IEEE1394	INT B#			

CHAPTER 3

BIOS Setup

This chapter gives a detailed explanation of the BIOS setup functions.

ENTERING SETUP

Power on the computer and press <Delete> during the beginning of the boot sequence to enter the BIOS setup menu. If you missed the BIOS setup entry point, you may restart the system and try again.

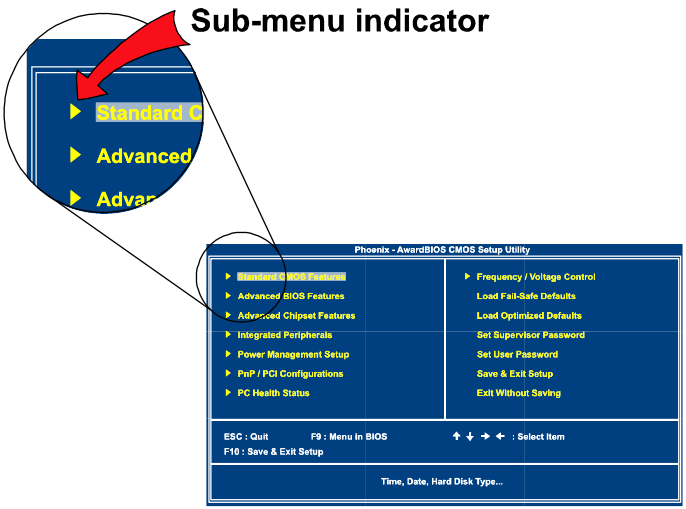
CONTROL KEYS

Keys	Description
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item in the left side
Right Arrow	Move to the item in the right side
Enter	Select the item
Escape	Jumps to the Exit menu or returns to the main menu from a submenu
Page Up / +	Increase the numeric value or make changes
Page Down / -	Decrease the numeric value or make changes
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F5	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6	Load the default CMOS value from Fail-Safe default table, only for Option Page Setup Menu
F7	Load Optimized defaults
F9	Jumps to the Main Menu
F10	Save all the CMOS changes and exit

NAVIGATING THE BIOS MENUS

The main menu displays all the BIOS setup categories. Use the control keys Up/Down arrow keys to select any item/sub-menu. Description of the selected/highlighted category is displayed at the bottom of the screen.

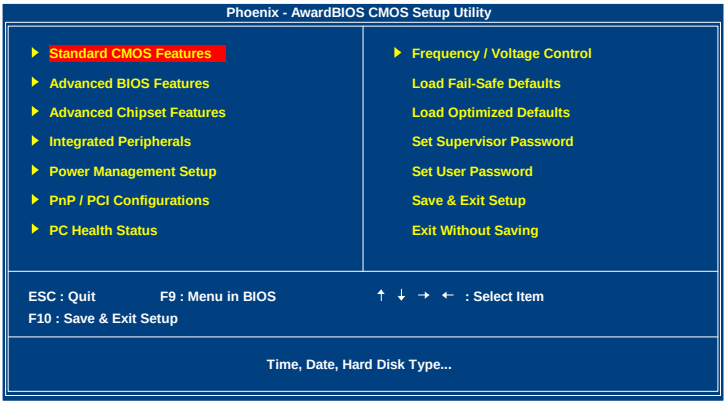
An arrow symbol next to a field indicates that a sub-menu is available (see figure below). Press <Enter> to display the sub-menu. To exit the sub-menu, press <Esc>.



GETTING HELP

The BIOS setup program provides a "General Help" screen. You can display this screen from any menu/sub-menu by pressing <F1>. The help screen displays the keys for using and navigating the BIOS setup. Press <Esc> to exit the help screen.

MAIN MENU



Standard CMOS Features

Use this menu to set basic system configurations.

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to set chipset specific features and optimize system performance.

Integrated Peripherals

Use this menu to set onboard peripherals features.

Power Management Setup

Use this menu to set onboard power management functions.

PnP/PCI Configurations

Use this menu to set the PnP and PCI configurations.

PC Health Status

This menu shows the PC health status.

Frequency/Voltage Control

Use this menu to set the system frequency and voltage control.

Load Fail-Safe Defaults

Use this menu option to load the BIOS default settings for minimal and stable system operations.

Load Optimized Defaults

Use this menu option to load BIOS default settings for optimal and high performance system operations.

Set Supervisor Password

Use this menu option to set the BIOS supervisor password.

Set User Password

Use this menu option to set the BIOS user password.

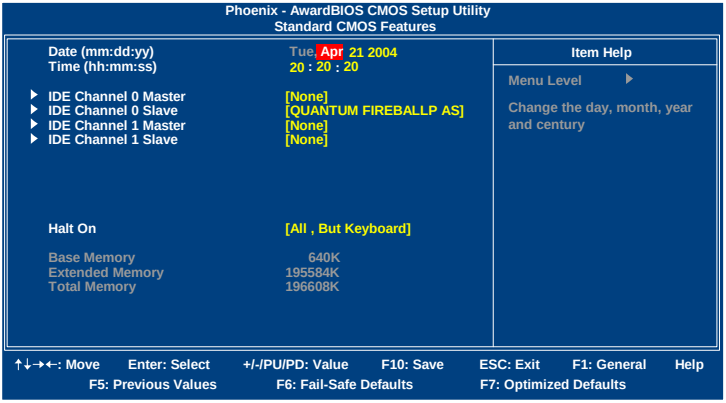
Save & Exit Setup

Save BIOS setting changes and exit setup.

Exit Without Saving

Discard all BIOS setting changes and exit setup.

STANDARD CMOS FEATURES



Date

The date format is [Day, Month Date Year]

Time

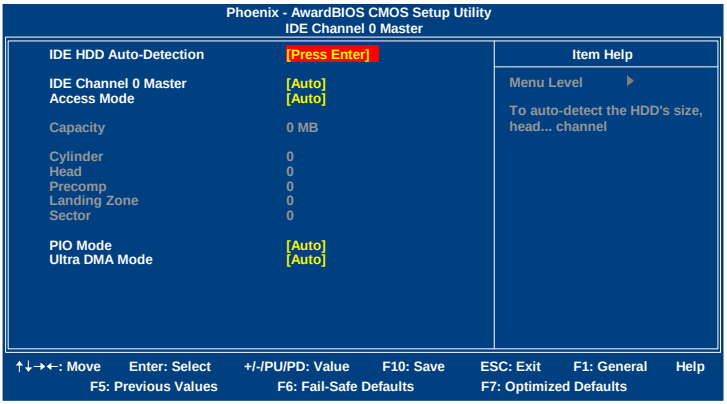
The time format is [Hour : Minute : Second]

Halt On

Sets the system's response to specific boot errors. Below is a table that details the possible settings.

Setting	Description
All Errors	System halts when any error is detected
No Errors	System does not halt for any error
All, But Keyboard	System halts for all non-key errors

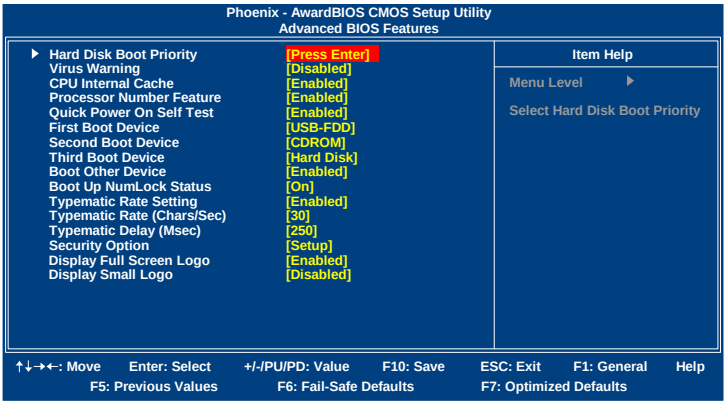
IDE DRIVES



The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter incorrect information in this category. Select "Auto" whenever possible. If you select "Manual", make sure the information is from your hard disk vendor or system manufacturer. Below is a table that details required hard drive information when using the "Manual" mode.

Setting	Description
IDE Channel	The name of this match the name of the menu. Settings: [None, Auto, Manual]
Access Mode	Settings: [CHS, LBA, Large, Auto]
Capacity	Formatted size of the storage device
Cylinder	Number of cylinders
Head	Number of heads
Precomp	Write precompensation
Landing Zone	Cylinder location of the landing zone
Sector	Number of sectors
PIO Mode	Settings: [0, 1, 2, 3, 4]
Ultra DMA Mode	Settings: [Disabled, Auto]

ADVANCED BIOS FEATURES



Virus Warning

Setting	Description
Enabled	Turns on hard disk boot sector virus protection
Disabled	Turns off hard disk boot sector virus protection

CPU Internal Cache

Setting	Description
Enabled	Turns on CPU internal cache
Disabled	Turns off CPU internal cache

Processor Number Feature

Setting	Description
Enabled	Turns on Processor Number Feature
Disabled	Turns off Processor Number Feature

Quick Power On Self-Test

Shortens Power On Self-Test (POST) cycle to enable shorter boot up time.

Setting	Description
Enabled	Shorten Power On Self Test (POST) cycle and bootup time
Disabled	Standard Power On Self Test (POST)

First/Second/Third Boot Device

Set the boot device sequence as BIOS attempts to load the disk operating system.

Setting	Description
LS120	Boot from LS-120 drive
Hard Disk	Boot from the HDD
SCSI	Boot from SCSI
CD-ROM	Boot from CD-ROM
ZIP100	Boot from ATAPI ZIP drive
USB-FDD	Boot from USB floppy drive
USB-ZIP	Boot from USB ZIP drive
USB-CDROM	Boot from USB CDROM
LAN	Boot from network drive
Disabled	Disable the boot device sequence

Boot Other Device

Enables the system to boot from alternate devices if the system fails to boot from the "First/Second/Third Boot Device" list.

Setting	Description
Enabled	Enable alternate boot device
Disabled	No alternate boot device allowed

Boot Up NumLock Status

Set the NumLock status when the system is powered on.

Setting	Description
On	Forces keypad to behave as 10-key
Off	Forces keypad to behave as arrow keys

Typematic Rate Setting

Enables "Typematic Rate" and "Typematic Delay" functions.

Settings: [Enabled, Disabled]

Typematic Rate (Chars/Sec)

This item sets the rate (characters/second) at which the system retrieves a signal from a depressed key.

Settings: [6, 8, 10, 12, 15, 20, 24, 30]

Typematic Delay (Msec)

This item sets the delay between when the key was first pressed and when the system begins to repeat the signal from the depressed key.

Settings: [250, 500, 750, 1000]

Security Option

Selects whether the password is required every time the System boots, or only when you enter Setup.

Setting	Description
Setup	Password prompt appears only when end users try to run BIOS Setup
System	Password prompt appears every time when the computer is powered on and when end users try to run BIOS Setup

Display Full Screen Logo

Show full screen logo during BIOS boot up process.

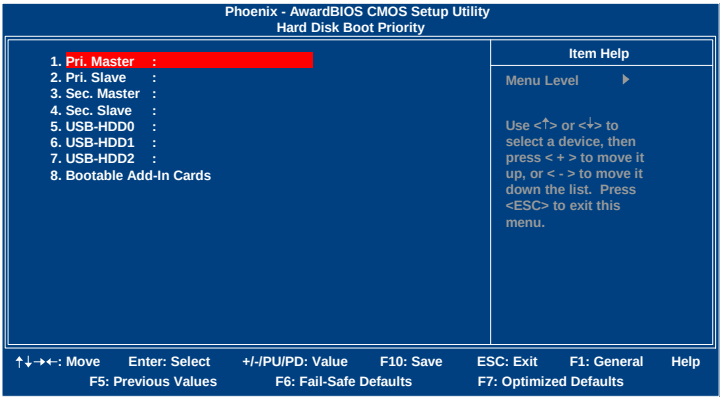
Settings: [Enabled, Disabled]

Display Small Logo

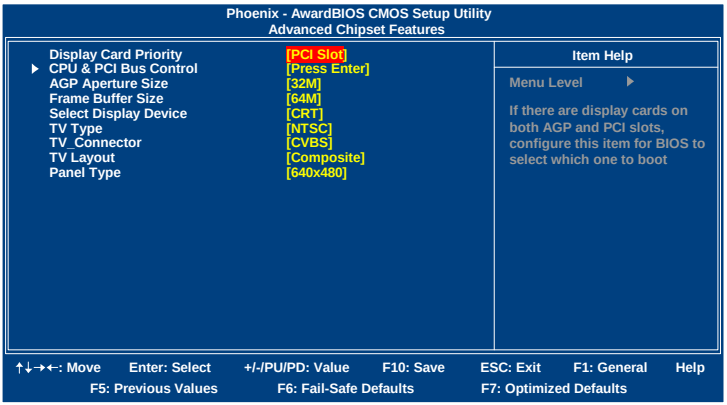
Show small energy star logo during BIOS boot up process.

Settings: [Enabled, Disabled]

HARD DISK BOOT PRIORITY



ADVANCED CHIPSET FEATURES



Caution:
The Advanced Chipset Features menu is used for optimizing the chipset functions. Do not change these settings unless you are familiar with the chipset.

Display Card Priority

This setting specifies which VGA card is your primary graphics adapter.
Settings: [PCI Slot and AGP]

AGP Aperture Size

This setting controls how much memory space can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

Settings: [32MB, 64MB, 128MB, 256MB, 512MB]

Frame Buffer Size

This setting instructs the BIOS to reserved the specified amount of memory for the internal video controller.

Settings: [16M, 32M, 64M, Disabled]

Select Display Device

This setting refers to the type of display being used with the system.

Settings: [CRT, TV, CRT + TV, LCD, CRT + LCD, DVI, DVI + TV, CRT + DVI]

TV Type

This setting refers to the native resolution of the display being used with the system.

Settings: [NTSC, PAL]

TV_Connector

When setting this menu item, be sure that the setting does not conflict with the "TV Layout" menu item.

Settings: [CVBS, S-Video 0]

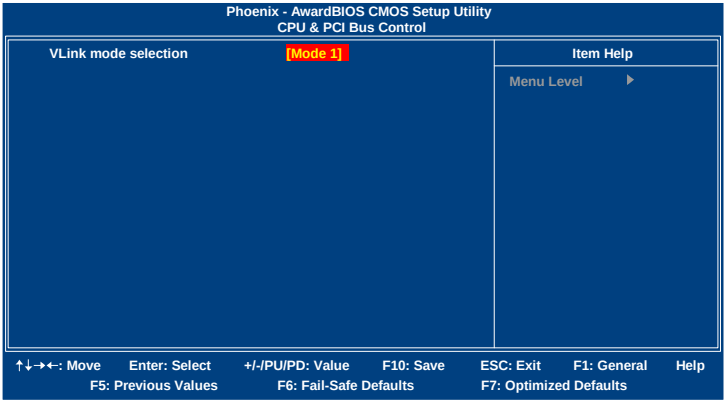
TV Layout

Settings: [Composite, S-Video, COMP. + S-Video]

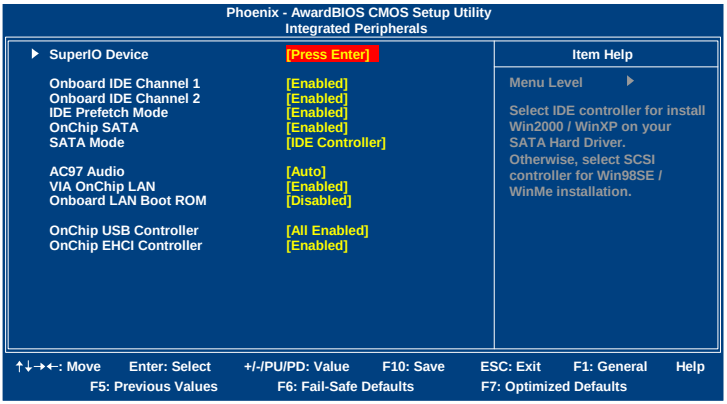
Panel Type

This setting refers to the native resolution of the display being used with the system.

Settings: [1600x1200, 1400x1050, 1280x1024, 1280x768, 1024x768, 800x600, 640x480]


Phoenix - AwardBIOS CMOS Setup Utility
CPU & PCI Bus Control
VLink mode selection
[Mode 1]
Item Help
Menu Level
↑↓→←: Move
Enter: Select
+/-/PU/PD: Value
F10: Save
ESC: Exit
F1: General Help
F5: Previous Values
F6: Fail-Safe Defaults
F7: Optimized Defaults

INTEGRATED PERIPHERALS



Onboard IDE Channel 1 and 2

The integrated peripheral controller contains an IDE interface with support for two IDE channels.

Setting	Description
Enabled	Activates each channel separately
Disabled	Deactivates IDE channels

IDE Prefetch Mode

This allows the hard disk controller to use the fast block mode to transfer data to and from the hard disk drive. Block mode is also called block transfer, multiple commands or multiple sector read / write.

Setting	Description
Enabled	Block mode
Disabled	Standard mode

OnChip SATA

Settings: [Enabled, Disabled]

SATA Mode

Serial ATA is the latest generation of the ATA interface. Serial ATA hard drives deliver transfer speeds of up to 150MB/sec.

Setting	Description
IDE	Supports two SATA plus two PATA hard disk drives
RAID	Only SATA supports RAID

AC'97 Audio

Auto allows the mainboard to detect whether an audio device is used. If the device is detected, the onboard VIA AC'97 (Audio Codec'97) controller will be enabled; otherwise, it is disabled. Disable the controller if another controller card is being used to connect to an audio device.

Setting	Description
Auto	Enables onboard controller if audio device is detected
Disabled	Turn off onboard controller to allow external controller

VIA OnChip LAN

Settings: [Enabled, Disabled]

Onboard LAN Boot ROM

Settings: [Enabled, Disabled]

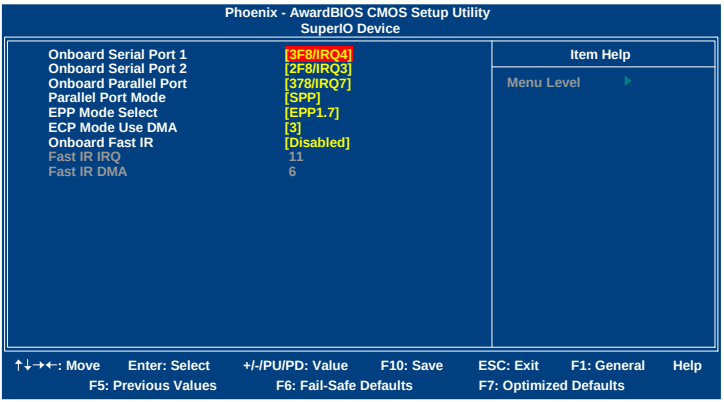
OnChip USB Controller

Settings: [All Enabled, All Disabled]

OnChip EHCI Controller

Settings: [Enabled, Disabled]

SUPER IO DEVICE



Onboard Serial Port 1/2

Sets the base I/O port address and IRQ for the onboard serial ports A and B. Selecting "Auto" allows the BIOS to automatically determine the correct base I/O port address.

Port	Settings					
1	Disabled	3F8 IRQ4	2F8 IRQ3	3E8 IRQ4	2E8 IRQ3	Auto
2	Disabled	3F8 IRQ4	2F8 IRQ3	3E8 IRQ4	2E8 IRQ3	Auto

Onboard Parallel Port

This specifies the I/O port address and IRQ of the onboard parallel port.

Settings: [Disabled, 378/IRQ7, 278/IRQ5, 3BC/IRQ7]

Parallel Port Mode

Set the parallel port mode. To operate the onboard parallel port as Standard Parallel Port, choose *SPP*. To operate the onboard parallel port in the EPP mode, choose *EPP*. By choosing *ECP*, the onboard parallel port will operate in ECP mode. Choosing *ECP + EPP* will allow the onboard parallel port to support both the ECP and EPP modes simultaneously.

Settings: [SPP, EPP, ECP, ECP + EPP]

EPP Mode Select

EPP (Enhanced Parallel Port) comes in two modes: 1.9 and 1.7. EPP 1.9 is the newer version of the protocol and is backwards compatible with most EPP devices. If your EPP device does not work with the EPP 1.9 setting, try changing the setting to EPP 1.7.

Settings: [EPP 1.9, EPP 1.7]

ECP Mode Use DMA

ECP (Extended Capabilities Port) has two DMA channels that it can use. The default channel is 3. However, some expansion cards may use channel 3 as well. To solve this conflict, change the ECP channel to 1. Select a DMA channel for the port.

Settings: [1, 3]

Onboard Fast IR

Enables "Fast IR IRQ" and "Fast IR DMA" functions.

Settings: [Enabled, Disabled]

Fast IR IRQ

Set this field to reserve an IRQ for the Fast IR port.

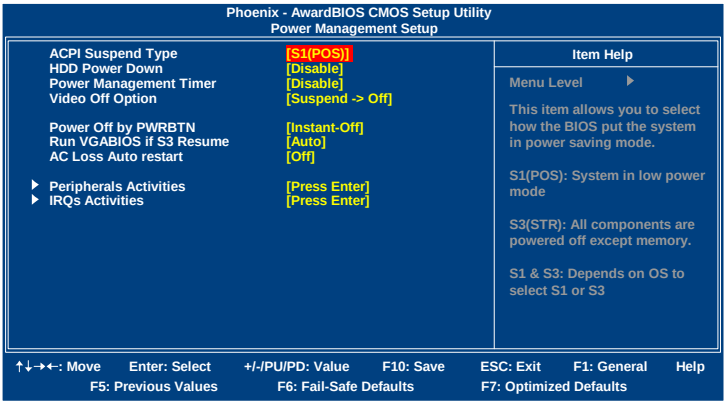
Settings: [3, 4, 5, 11]

Fast IR DMA

Set this field to choose the DMA channel.

Settings: [6, 5]

POWER MANAGEMENT SETUP



ACPI Suspend Type

Setting	Description
S1(POS)	S1/Power On Suspend (POS) is a low power state. In this state, no system context (CPU or chipset) is lost and hardware maintains all system contexts.
S3(STR)	S3/Suspend To RAM (STR) is a power-down state. In this state, power is supplied only to essential components such as main memory and wakeup-capable devices. The system context is saved to main memory, and context is restored from the memory when a "wakeup" event occurs.
S1 & S3	Depends on the OS to select S1 or S3.

HDD Power Down

Sets the length of time for a period of inactivity before powering down the hard disk.

Settings: [Disabled, 1~15(minutes)]

Power Management Timer

Set the idle time before system enters power saving mode. ACPI OS such as Windows XP will override this option.

Settings: [Disabled, 1/2/4/6/8/10/20/30/40(minutes), 1(hour)]

Video Off Option

Select whether or not to turn off the screen when system enters power saving mode, ACPI OS such as Windows XP will override this option.

Setting	Description
Always On	Screen is always on even when system enters power saving mode
Suspend -> Off	Screen is turned off when system enters power saving mode

Power Off by PWRBTN

This field configures the power button on the chassis.

Setting	Description
Delay 4 Sec	System is turned off if power button is pressed for more than four seconds
Instant-Off	Power button functions as a normal power-on/-off button

Run VGABIOS if S3 Resume

Select whether to run VGA BIOS if resuming from S3 state. This is only necessary for older VGA drivers.

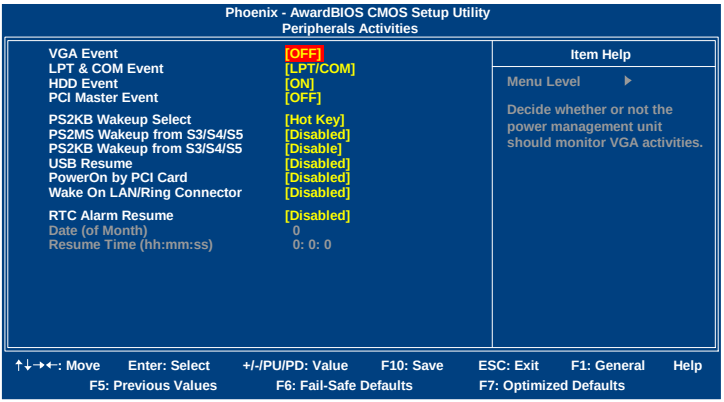
Settings: [Auto, Yes, No]

AC Loss Auto restart

The field defines how the system will respond after an AC power loss during system operation.

Setting	Description
Off	Keeps the system in an off state until the power button is pressed
On	Restarts the system when the power is back

PERIPHERAL ACTIVITIES



VGA Event

Enables the power management unit to monitor VGA activities.

Settings: [Off, On]

LPT & COM Event

Decide whether or not the power management unit should monitor parallel port (LPT) and serial port (COM) activities.

Settings: [None, LPT, COM and LPT / COM]

HDD Event

Enables the power management unit to monitor hard disk activities.

Settings: [Off, On]

PCI Master Event

Enables the power management unit to monitor PCI master activities.

Settings: [Off, On]

PS2KB Wakeup Select

When selecting "Password", press <Page Up> or <Page Down> to change password. The maximum number of characters is eight. "PS2MS Wakeup from S3/S4/S5" and "PS2KB Wakeup from S3/S4/S5" will be disabled while changing the password.

Settings: [Hot Key, Password]

PS2MS Wakeup from S3/S4/S5

Enables any mouse activity to restore the system from the power saving mode to an active state.

Settings: [Disabled, Enabled]

PS2KB Wakeup from S3/S4/S5

Sets a Hot Key to restore the system from the power saving mode to an active state.

Settings: [Disabled, Ctrl+F1, Ctrl+F2, Ctrl+F3, Ctrl+F4, Ctrl+F5, Ctrl+F6, Ctrl+F7, Ctrl+F8, Ctrl+F9, Ctrl+F10, Ctrl+F11, Ctrl+F12, Power, Wake, Any Key]

USB Resume

Enables activity detected from USB devices to restore the system from a suspended state to an active state.

Settings: [Disabled, Enabled]

PowerOn by PCI Card

Enables activity detected from any PCI card to power up the system or resume from a suspended state. Such PCI cards include LAN, onboard USB ports, etc.

Settings: [Disabled, Enabled]

Wake On LAN Connector

Enables any WOL signals from the modem to restore the system from a suspended state to an active state.

Settings: [Disabled, Enabled]

RTC Alarm Resume

Sets a scheduled time and/or date to automatically power on the system.

Settings: [Disabled, Enabled]

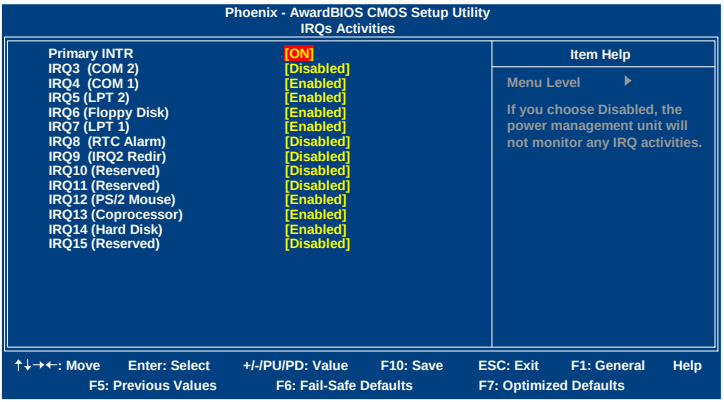
Date (of Month)

The field specifies the date for "RTC Alarm Resume".

Resume Time (hh:mm:ss)

The field specifies the time for "RTC Alarm Resume".

IRQs ACTIVITIES



Primary INTR

Restores the system to an active state if IRQ activity is detected from any of the enabled channels

Settings: [Off, On]

IRQ3~IRQ15

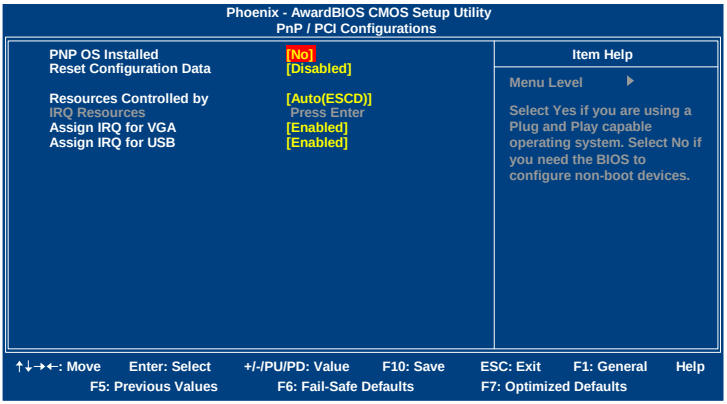
Enables or disables the monitoring of the specified IRQ line. These fields are only available if "Primary INTR" is on.

Settings: [Enabled, Disabled]

Note:

IRQ (Interrupt Request) lines are system resources allocated to I/O devices. When an I/O device needs to gain attention of the operating system, it signals this by causing an IRQ to occur. After receiving the signal, when the operating system is ready, the system will interrupt itself and perform the service required by the IO device.

PNP/PCI CONFIGURATIONS



Note:

This section covers some very technical items and it is strongly recommended to leave the default settings as is unless you are an experienced user.

PNP OS Installed

Setting	Description
Yes	BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system
No	BIOS will initialize all the PnP cards

Reset Configuration Data

This field should usually be left "Disabled".

Setting	Description
Enabled	Resets the ESCD (Extended System Configuration Data) after exiting BIOS Setup if a newly installed PCI card or the system configuration prevents the operating system from loading
Disabled	Default setting

Resource Controlled By

Enables the BIOS to automatically configure all the Plug-and-Play compatible devices.

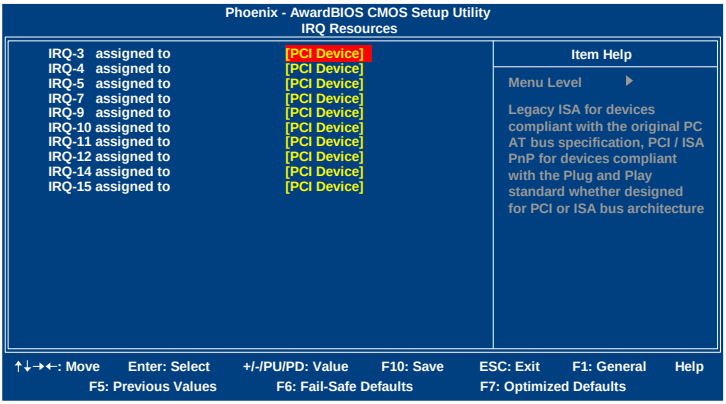
Setting	Description
Auto(ESCD)	BIOS will automatically assign IRQ, DMA and memory base address fields
Manual	Unlocks "IRQ Resources" for manual configuration

Assign IRQ For VGA/USB

Assign IRQ for VGA and USB devices.

Settings: [Disabled, Enabled]

IRQ RESOURCES



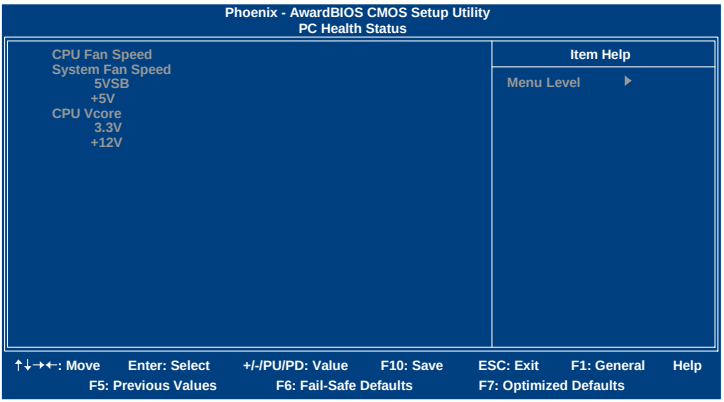
Note:

The items are adjustable only when “Resources Controlled By” is set to “Manual.”

IRQ Resources list IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ.

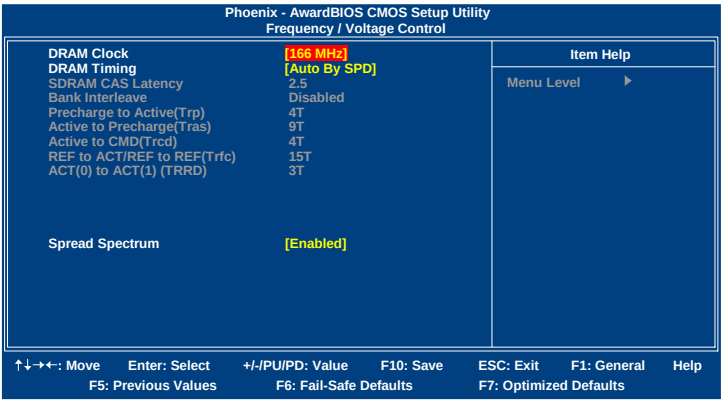
Setting	Description
PCI Device	For Plug-and-Play compatible devices designed for PCI bus architecture
Reserved	The IRQ will be reserved for other requests

PC HEALTH STATUS



The PC Health Status displays the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and fan speeds.

FREQUENCY / VOLTAGE CONTROL



DRAM Clock

The chipset supports synchronous and asynchronous mode between host clock and DRAM clock frequency.

Settings: [66 MHz, 100 MHz, 133 MHz, 166 MHz, By SPD]

DRAM Timing

The value in this field depends on the memory modules installed in your system. Changing the value from the factory setting is not recommended unless you install new memory that has a different performance rating than the original modules.

Settings: [Manual, By SPD]

SDRAM CAS Latency

This item is for setting the speed it takes for the memory module to complete a command. Generally, a lower setting will improve the performance of your system. However, if your system becomes less stable, you should change it to a higher setting. This field is only available when "DRAM Timing" is set to "Manual".

Settings: [2, 2.5]

Bank Interleave

This item is for setting the interleave mode of the SDRAM interface. Interleaving allows banks of SDRAM to alternate their refresh and access cycles. One bank will undergo its refresh cycle while another is being accessed. This improves performance of the SDRAM by masking the refresh time of each bank. This field is only available when "DRAM Timing" is set to "Manual".

Settings: [Disabled, 2 Bank, 4 Bank]

Precharge to Active (Trp)

This field is for setting the length of time it takes to precharge a row in the memory module before the row becomes active. Longer values are safer but may not offer the best performance. This field is only available when "DRAM Timing" is set to "Manual".

Settings: [2T, 3T]

Active to Precharge (Tras)

This field is for setting the length of time it a row stays active before precharging. Longer values are safer but may not offer the best performance. This field is only available when "DRAM Timing" is set to "Manual".

Settings: [5T, 6T]

Active to CMD (Trcd)

This field is only available when "DRAM Timing" is set to "Manual".

Settings: [2T, 3T]

REF to ACT / REF to REF (Trfc)

This field is only available when "DRAM Timing" is set to "Manual".

Settings: [12T, 13T, 14T, 15T]

ACT(0) to ACT(1) (TRRD)

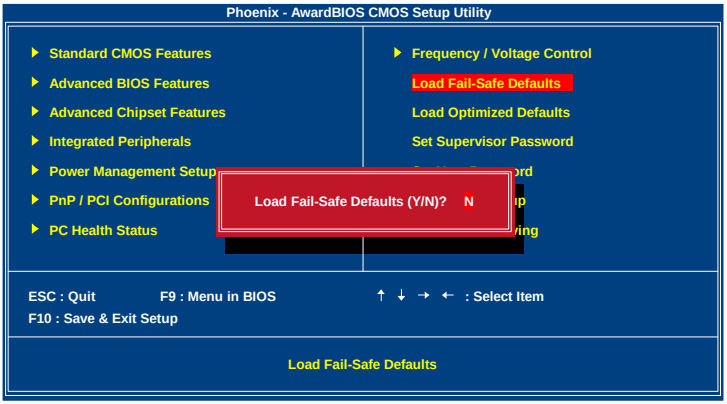
This field is only available when "DRAM Timing" is set to "Manual".

Settings: [2T, 3T]

Spread Spectrum

When the mainboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves.

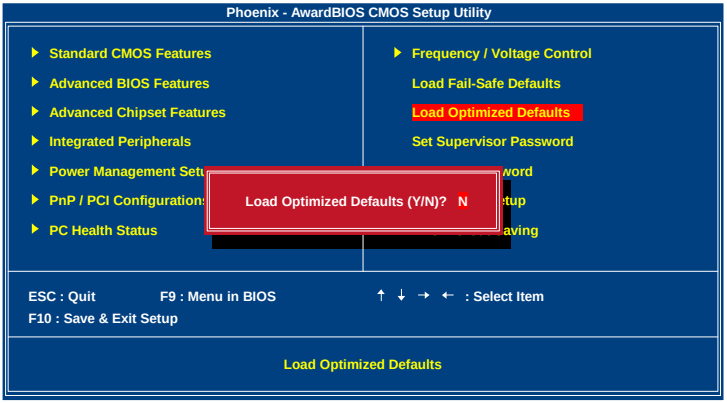
LOAD FAIL-SAFE DEFAULTS



This option is for restoring all the default fail-safe BIOS settings. These values are set by the mainboard manufacturer to provide a stable system with basic performance.

Entering "Y" loads the default fail-safe BIOS values.

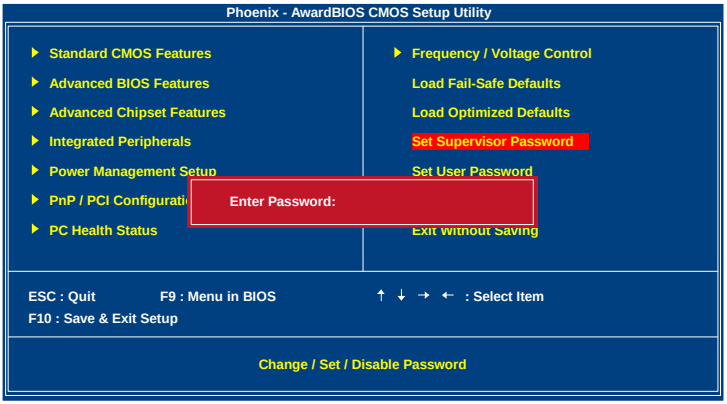
LOAD OPTIMIZED DEFAULTS



This option is for restoring all the default optimized BIOS settings. The default optimized values are set by the mainboard manufacturer to provide a stable system with optimized performance.

Entering "Y" loads the default optimized BIOS values.

SET SUPERVISOR / USER PASSWORD



This option is for setting a password for entering BIOS Setup. When a password has been set, a password prompt will be displayed whenever BIOS Setup is run. This prevents an unauthorized person from changing any part of your system configuration.

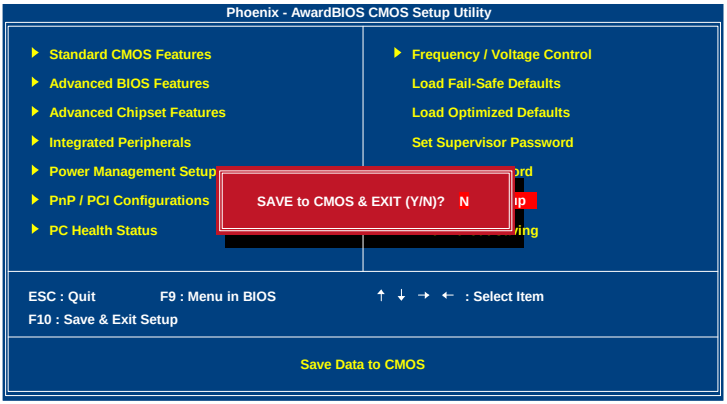
There are two types of passwords you can set. A supervisor password and a user password. When a supervisor password is used, the BIOS Setup program can be accessed and the BIOS settings can be changed. When a user password is used, the BIOS Setup program can be accessed but the BIOS settings cannot be changed.

To set the password, type the password (up to eight characters in length) and press <Enter>. The password typed now will clear any previously set password from CMOS memory. The new password will need to be reentered to be confirmed. To cancel the process press <Esc>.

To disable the password, press <Enter> when prompted to enter a new password. A message will show up to confirm disabling the password. To cancel the process press <Esc>.

Additionally, when a password is enabled, the BIOS can be set to request the password each time the system is booted. This would prevent unauthorized use of the system. See "Security Option" in the "Advanced BIOS Features" section for more details.

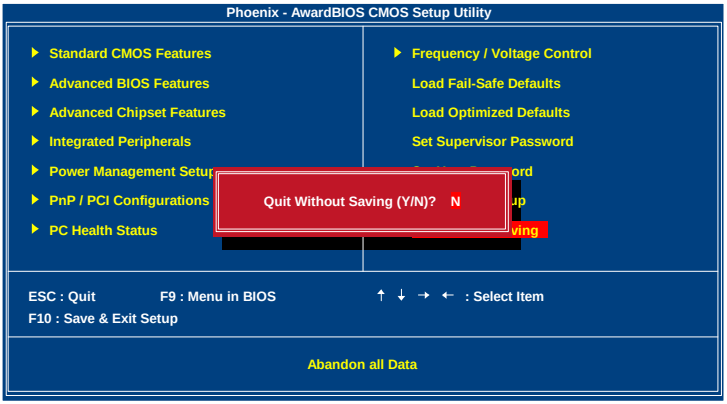
SAVE & EXIT SETUP



Entering "Y" saves any changes made and exits the program.

Entering "N" will cancel the exit request.

EXIT WITHOUT SAVING



Entering "Y" discards any changes made and exits the program.

Entering "N" will cancel the exit request.

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CHAPTER 4

Driver Installation

This chapter gives you brief descriptions of each mainboard driver and application. You must install the VIA chipset drivers first before installing other drivers such as audio or VGA drivers. The applications will only function correctly if the necessary drivers are already installed.

DRIVER UTILITIES

Getting Started

The mainboard includes a Driver Utilities CD that contains the driver utilities and software for enhancing the performance of the mainboard. If the CD is missing from the retail box, please contact the local dealer for the CD.

Note:
The driver utilities and software are updated from time to time. The latest updated versions are available at http://www.viaembedded.com/

Running the Driver Utilities CD

To start using the CD, insert the CD into the CD-ROM or DVD-ROM drive. The CD should run automatically after closing the CD-ROM or DVD-ROM drive. The driver utilities and software menu screen should then appear on the screen. If the CD does not run automatically, click on the "Start" button and select "Run…" Then type: "D:\Setup.exe".

Note:
D: might not be the drive letter of the CD-ROM/DVD-ROM in your system.

CD CONTENT

- ☒ **VIA 4in1 Drivers:** Contains VIA ATAPI Vendor Support Driver (enables the performance enhancing bus mastering functions on ATA-capable Hard Disk Drives and ensures IDE device compatibility), AGP VxD Driver (provides service routines to your VGA driver and interface directly to hardware, providing fast graphical access), IRQ Routing Miniport Driver (sets the system's PCI IRQ routing sequence) and VIA INF Driver (enables the VIA Power Management function).
- ☒ **VIA Graphics Driver:** Enhances the onboard VIA graphic chip.
- ☒ **VIA Audio Driver:** Enhances the onboard VIA audio chip.
- ☒ **VIA USB 2.0 Driver:** Enhances VIA USB 2.0 ports.
- ☒ **VIA LAN Driver:** Enhances the onboard VIA LAN chip.
- ☒ **VIA FIR Driver:** Support for FIR.
- ☒ **VIA SATA Driver:** Support for SATA devices.